Application Number 09/851,363
Amendment in response to Office Action mailed January 8, 2008

REMARKS

This Amendment is responsive to the Office Action dated January 8, 2008. Applicant has amended claims 1, 11, 14, 19, 20, 25, 29–30, 32, 56, 60–63, 71, 77, 82, 84 and 86. Applicant has canceled claims 2, 16–17, 21, 23–24, 26–28, 31, 33, 47–48, 52–55, 57–58, 81, 83, and 85. Claims 1, 6–8, 10–15, 19–20, 25, 29–30, 32, 39–44, 46, 56, 60–71, 77–80, 82, 84, and 86 are pending.

Claim Rejection Under 35 U.S.C. § 112

In the Office Action, the Examiner rejected claims 1, 2, 6–8, 10–17, 19–21, 23–33, 39–44, 46–48, 52–58, 60–71, and 77–86 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. In particular, the Examiner asserted that Applicant's specification failed to demonstrate that the memory used to receive incoming packets was the same as the memory from which outbound packets are sent. Applicant respectfully directs the Examiner's attention to Applicant's specification, page 6, ll. 19–22. This portion of Applicant's specification states, in relevant part, "When router 200 receives a packet through a network link 202, memory management ASIC 216 writes data to memory 212 associated with packet processing ASICs 210. When a packet is assembled and sent, memory management ASIC 214 reads data from memory 212 associated with packet processing ASICs 210." (emphasis added). Likewise, at p. 9, ll. 8–17, Applicant's specification specifies that it is memory 212 from which packets are read for outbound transmission, stating in part, "In response to this notification, packet processing ASIC 210 reads the packet from memory 212 by issuing read commands to memory management ASIC 216 and receiving the packet data from memory management ASIC 214 (420)." Consequently, Applicant respectfully submits that Applicant's specification and claims conform to the requirements of 35 U.S.C. § 112, thus Applicant respectfully requests withdrawal of this rejection.

Claim Rejection Under 35 U.S.C. § 103

In the Office Action, the Examiner rejected claims 1, 2, 6–8, 10–14, 16–17, 19–21, 23–30, 32, 33, 39–44, 47–48, 52–58, 62, 61, 63–67, 71–79, and 81–86 under 35 U.S.C. § 103(a) as being unpatentable over Bechtolsheim et al. (US 7,218,632, *hereinafter* "Bechtolsheim") in view

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of Aditya (US 5,918,021, *hereinafter* "Aditya") and further in view of Wilford et al. (US
6,687,247, *hereinafter* "Wilford"). The Examiner also rejected claims 15, 31, 46, 62 and 80
under 35 U.S.C. § 103(a) as being unpatentable over Bechtolsheim in view of Aditya and further
in view of Wilford and Zadikian et al. (US 6,724,757, *hereinafter* "Zadikian"). Applicant
respectfully traverses the rejection to the extent such rejections may be considered applicable to
the claims as amended. The applied references fail to disclose or suggest the inventions defined
by Applicant's claims, and provide no teaching that would have suggested a rational reason to
arrive at the claimed invention.

In this Amendment, Applicant has amended the claims for the purpose of clarification.
For example, Applicant has amended claim 1 to require a midplane and a power supply coupled
to the midplane to supply power along the midplane, wherein the midplane provides power from
the power supply to the router module only when the router module is properly inserted into the
midplane. These amendments further clarify, for example, the meaning of a <u>removable</u> router
module. As required by amended claim 1, the router module comprises a packet forwarding
engine, memory, a memory management unit, and an interface card concentrator module.
Moreover, amended claim 1 requires that the router module is removably coupled to the
midplane of the routing device, and that the packet forwarding engine, memory management
unit, and the interface card concentrator module are integrated into a single unit.

Applicant's specification teaches the claims as currently amended. For example, FIG. 2
of Applicant's specification illustrates midplane 208. Applicant's specification further describes
how midplane 208 distributes power to cards connected to midplane 208, such as interface cards
206 (IFCs 206). *See, e.g.*, Applicant's specification, p. 5, ll. 29–31. Applicant's specification
also teaches a power supply connected to midplane 208 to supply power along midplane 208.
See, e.g., Applicant's specification, p. 9, ll. 18–23. Moreover, Applicant's specification teaches
that midplane 208 provides power from the power supply to the router module only when the
router module is properly inserted into midplane 208. For example, Applicant's specification
states:

> Sense lines from the single board router are used for precise regulation of the
> voltage.
>
> After an enable signal 514 is asserted (516), the 1.5 V power signal 504 is asserted
> after a delay of at least 3 seconds that is enforced by the power supply. The other

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> power signals are subsequently asserted one at a time, with delays of
> approximately 20 msec between assertion of power signals. When the 12 V
> power signal 512 is asserted, a power supply verification signal 518 becomes
> active. P. 9, l. 26–p. 10, l. 2.

Thus, the router module required by claim 1, in the example embodiment as described above, is "removably coupled" in the sense that when properly inserted into the midplane, power is provided to the router module, but if not inserted (or if not inserted properly), power is not provided to the router module.

The routing device required by claim 1 may provide several advantages over the prior art. For example, by integrating a packet forwarding engine and an interface card concentrator into a single, removable unit, a routing device manufacturer may save on overall costs. As another example, this configuration may permit interface cards to be installed in a more dense arrangement, allowing a greater number of interface cards in a given area. As yet a further example, fewer overall components may result in a higher overall system reliability. Moreover, the router module that includes the interface card concentrator may be removed for service without removing the interface cards themselves, potentially resulting in a lower chance of damage to the interface cards. Applicant's specification discusses several potential advantages of a routing arrangement such as that required by Applicant's amended claim 1 at page 2, line 29 to page 3, line 8 and page 11, line 30 to page 12, line 6, among others.

Applicant respectfully submits that the prior art, including Bechtolsheim, Aditya, Wilford, and Zadikian, alone or in combination, fail to teach, suggest, or disclose the routing device required by, e.g., claim 1 as clarified by the current amendments.

In the Office Action, the Examiner cited Bechtolsheim as teaching a router module wherein the packet forwarding engine, memory management unit, and interface card concentrator module are integrated into a single unit. Specifically, the Office Action cited router 100 in FIG. 1 of Bechtolsheim. However, Applicant's amended claim 1, as illustrated by the above clarification, requires that the single unit be a removable router module, not a router in and of itself. The Office Action stated that Bechtolsheim is "silent regarding ... a router module separate from the plurality of interface cards." Office Action dated Jan. 8, 2008, p. 5. Rather than being silent, however, Bechtolsheim teaches exactly the opposite of the requirement of Applicant's amended claim 1. Namely, Bechtolsheim teaches that the Serdes are connected via

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input interfaces 111 and output interfaces 112 to PPE 120, all of which are included in router 100. Bechtolsheim, FIG. 1 and col. 2, ll. 56–60. The Examiner cannot reasonably assert both that PPE 120, FFE 140, and the memories of router 100 of Bechtolsheim are a single unit and, simultaneously, that it would be obvious for one of ordinary skill in the art to treat these modules as separate from the plurality of interface cards.

The Office Action asserted that, although Bechtolsheim does not teach that the router module is separate from the plurality of interface cards, that Aditya teaches this requirement of amended claim 1. In particular, the Office Action cited FIG. 1 of Aditya as disclosing this requirement. The Office Action cited server 120 of FIG. 1 of Aditya as the "router module" and NICs 141 of FIG. 1 of Aditya as the interface cards. However, FIG. 1 clearly portrays that NICs 141 are within server 120, thus not at all separate. This is further illustrated by FIG. 2 of Aditya, which illustrates that adaptive driver software 126 is connected to each of NICs 141. Adaptive driver software 126 controls NICs 141 and is software installed on server 120. Aditya, col. 1, ll. 42–64. Thus Aditya, like Bechtolsheim, fails to teach, suggest, or disclose a router module separate from the plurality of interface cards as required by amended claim 1.

Moreover, Bechtolsheim in view of Aditya fails to teach, suggest, or disclose a midplane to which the interface cards and the router module are coupled, as required by amended claim 1. Likewise, Bechtolsheim in view of Aditya fails to teach, suggest, or disclose wherein the midplane provides power from the power supply to the router module only when the router module is properly inserted into the midplane as also required by amended claim 1.

The Office Action cited Wilford as disclosing a midplane at col. 5, ll. 1–10. Office Action dated Jan. 8, 2008, p. 5. However, Wilford makes no mention of a midplane in the cited portion, nor in any portion of its disclosure. Instead, the cited portion discusses a physical layer interface module (PLIM). Wilford teaches that the PLIM is used as part of inbound interface 111 of FIG. 1. A midplane, on the other hand, interconnects cards and supplies power to the cards. *See, e.g.,* Applicant's specification, p. 5, l. 28–p. 6, l. 7. Similarly, amended claim 1 requires that each of the plurality of interface cards are coupled to the midplane, that the router module is coupled to the midplane, and wherein the midplane provides power from the power supply to the router module only when the router module is properly inserted into the midplane. Thus the PLIM taught by Wilford is not a midplane as required by Applicant's amended claim 1.

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Although the above remarks have been presented primarily with respect to amended claim 1, Applicant has similarly amended all of the claims for the purpose of clarification. That is, Applicant has amended all of the claims to require a midplane, that the modules are connected to the midplane, and that the midplane provides power from the power supply to the router module only when the router module is properly inserted into the midplane. Moreover, all of the claims require a router module coupled to the midplane and separate from the interface cards. Therefore, the above remarks are relevant to all of Applicant's pending claims, i.e., claims 1, 6–8, 10–15, 19–20, 25, 29–30, 32, 39–44, 46, 56, 60–71, 77–80, 82, 84, and 86.

For at least these reasons, claims 1, 6–8, 10–15, 19–20, 25, 29–30, 32, 39–44, 46, 56, 60–71, 77–80, 82, 84, and 86 are patentable. Applicant therefore respectfully requests withdrawal of this rejection and allowance of all pending claims.
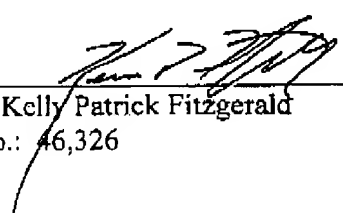
CONCLUSION

All claims in this application are in condition for allowance. Applicant respectfully requests reconsideration and prompt allowance of all pending claims. Please charge any additional fees or credit any overpayment to deposit account number 50-1778. The Examiner is invited to telephone the below-signed attorney to discuss this application.

Date:

April 7 2008

SHUMAKER & SIEFFERT, P.A.
1625 Radio Drive, Suite 300
Woodbury, Minnesota 55125
Telephone: 651.735.1100
Facsimile: 651.735.1102

By:

Name: Kelly Patrick Fitzgerald
Reg. No.: 46,326

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